

**BEFORE THE BOARD OF APPEALS AND INTERFERENCES
OF THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Appellant(s): SHEPHERD, James et al. Examiner: ROBERTS, Jessica M.
Serial No.: 10/817,436 Group Art Unit: 2621
Filed: April 5, 2004 Confirmation No. 1291
Title: APPARATUS AND PROCESS FOR RE-TIMING VIDEO CUTS

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P. O. Box 1450
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REPLY BRIEF

SIR:

This Reply Brief to the Board of Appeals and Interferences of the United States Patent and Trademark Office is being filed in response to the Examiner's Answer that was mailed by the United States Patent and Trademark Office in connection with the appeal of the final Office Action dated November 24, 2008 in above-identified Application. A Reply Brief in response to the December 17, 2009 Examiner's Answer is due February 17, 2010. Accordingly, this Reply Brief is being timely filed.

Kindly consider the following remarks:

REMARKS

Appellants address their remarks herein solely to the Examiner's Responses to Arguments presented in Appellants' appeal Brief dated July 23, 2009.

I. Rejection of Claims 1-4 and 9 as Anticipated by Wu et al.

A. The Examiner's Responses re Claims 1-4

1. The Examiner's Responses to Appellants' Arguments

The Examiner's Responses to Appellants' Arguments are essentially repetitions of the same incorrect assertions that the Examiner has previously made, for example in the final Office Action at pages 3-6. In response to all of Appellants' arguments set forth in the Appeal Brief, the Examiner repeats her previous reliance on the following text of Wu et al. at column 9, lines 21-25 and column 10, lines 1-5 and 19-22:

Case 1-A indicates resetting of the picture type based on the scene change detection for a frame sequence B, P, B, P, B. Specifically, in Frame 4, the P-frame is changed to an I-frame. This indicates the start of a new GOP.

Case 1-B indicates resetting of the picture type based on the scene change detection for a frame sequence P, B, P, B, P. Specifically, in Frame 3, the P-frame is changed to an I-frame.

Various other frames sequences are possible.

* * *

Generally, when a scene change frame is detected, and the scene change frame is a P-frame, it is changed to an I-frame. If the scene change frame is not a P-frame, the first P-frame following the scene change frame is changed to an I-frame.

The Examiner repeats this contention multiple times in the Examiner's Answer:

- At page 13, the Examiner states "Since Wu discloses changing a P frame to an I frame, and the frame is composed of three input fields, it is clear to the examiner that Wu is fully capable of changing either of the input fields to an I frame, which reads on the claimed limitation."
- At pages 14-15, again at page 15, again at page 16, and again at page 17, the Examiner states "Since converting is analogous to change which would indicate a transformation, and Wu discloses detecting scene changes between successive fields, and when a scene change frame is

detected and the scheme change is a P frame, it is changed to an I-frame, and a frame is composed of two fields, therefore it is clear to the examiner that changing a P frame to an I-frame when a scene change is detected is equivalent to transforming the P-frame to an I-frame which reads on the claimed limitation.”

2. The Examiner’s Misunderstanding of Wu et al.

Appellants point out that the entirety of the Examiner’s response rests on a single false premise, namely that the statement in Wu that “a P-frame is changed to an I-frame” in the passage above is equivalent to recitation in Claim 1 of “generating from said second field a synthetic field and replacing said first field by said synthetic field”.

In Wu et al., the only relevant “change” is a change in encoding strategy. What would otherwise have been encoded as a P-frame is instead not encoded as a P-frame and rather is encoded as an I-frame. The P-frame in question does not come into existence.

Wu et al. states that the disclosure therein “relates to an efficient video compression scheme that detects scene changes between successive fields, including flashes, or bad fields that result from improper editing, and adjusts the picture coding type and GOP boundaries in response thereto.” (See Wu et al., column 1, line 66 – column 2, line 3, emphasis added) Wu et al. do not disclose the actual replacement of a P frame with an I frame, but rather only that the coding type is adjusted.

Wu et al. further state:

In accordance with the present invention, scene change detection is performed at a preprocessing stage of a video encoder. The final decision to encode a frame as an I- or P-frame is not made until a final encoding stage. That is, the encoder’s processing pipeline is used as a lookahead buffer to minimize the amount of required frame buffer memory. (Wu et al., at column 2, lines 9-14, emphasis added)

* * *

This is different from prior art schemes that perform both scene change detection and picture coding type decision at the preprocessing stage, thereby requiring a large amount of lookahead frame buffer, or perform both scene change detection and picture coding type decision at the encoding stage, which does not provide any lookahead capability. Advantageously, the pipeline architecture 200

provides the required lookahead delay to avoid issuing a scheduled I-frame at the proximity of a scene change, while minimizing the amount of frame buffer memory required to provide the lookahead capability. (Wu et al., at column 4, lines 57-67, emphasis added)

Wu et al. is concerned with the preprocessing stage of a video encoder, wherein scene detection and identification of the frames is made, so as to minimize the frame buffer memory required. The system of Wu et al. provides a delay to avoid the mistaken scheduling of an I-frame or a P-frame at an incorrect location.

Wu et al. makes clear that, in the passage quoted by the Examiner, this “change” of a P-frame to an I-frame is an issue of encoding of the frame, rather than an actual change to the frame. Within the same passage quoted by the Examiner, Wu et al. state that “Case 1-A indicates resetting of the picture type based on the scene change detection for a frame sequence B, P, B, P, B” and “Case 1-B indicates resetting of the picture type based on the scene change detection for a frame sequence P, B, P, B, P.” It is thus specifically stated by Wu et al. that the “change of a P-frame to an I-frame” is merely one of “resetting of the picture type”, rather than an actual change to the frame.

Thus, in the passage repeatedly relied upon by the Examiner, when Wu et al. state that “when a scene change frame is detected, and the scene change frame is a P-frame, it is changed to an I-frame” and “If the scene change frame is not a P-frame, the first P-frame following the scene change frame is changed to an I-frame”, these changes clearly refer to resetting of the picture type, i.e., the encoding of the particular frame, rather than an actual change to the frame itself.

Appellants argued that, even if a P-frame had been formed, it would be technically impossible to derive an I-frame from the P-frame because, by definition, the P-frame contains only difference information, and there simply would be insufficient information in a P-frame to allow it to be changed into an I-frame. Since a P-frame is only a set of differences, an I-frame, which is a full picture, requires information that simply would not be present in the P-frame.

In response, the Examiner referred again to the quoted passage of Wu et al. and stated that “changing a P frame to an I-frame when a scene change is detected is equivalent to

transforming the P-frame to an I-frame which reads on the claimed limitation". The Examiner also stated (for the first time) that, since the disclosure has not provided an explicit definition for a synthetic frame, using the broadest interpretation the Examiner understands a "synthetic field" as a field that has been converted into another picture type. (Interestingly, the Examiner did not seem to have any problems understanding the term "synthetic" in connection with claims 10 and 11, which both use this word.)

Appellants argue that a question of whether "change" is analogous to "convert" or "transform", to which the Examiner refers several times, is irrelevant. Since claim 1 does not contain the word "convert" or the word "transform", it is not clear how this reads on the claimed limitation "generating from said second field a synthetic field and replacing said first field by said synthetic field".

Moreover, with regard to the definition of "synthetic", this word has a well known and established definition as "relating to or involving synthesis" ("synthesis" being defined as "the composition or combination of parts or elements so as to form a whole") (see Merriam-Webster Online Dictionary, Merriam-Webster, Inc. 2010, at <http://www.merriam-webster.com/dictionary/synthetic>). This is entirely consistent with the specification, which states at page 6, lines 27-31 that "field (204) [is replaced] with a new, synthetic field [is] constructed from the field (203)", and at page 7, lines 1-6 that "field (203) is replaced by a new field constructed from the field (204)". It is clear that "a synthetic field" means one that is constructed from another field or fields.

There is thus no reason for the Examiner to understand a "synthetic field" as a field that has been converted into another picture type, instead of a field that has been constructed from another field, as is clear from the specification. In addition, because the I-frame in Wu et al. is not, and cannot be, generated from the P-frame, no synthetic field is ever generated in Wu et al. and used to replace a first field, as required by claim 1. Appellants contend that it is inappropriate and disingenuous for the Examiner to perform a semantic analysis of the word "change" and to give it a meaning wholly different from and wholly inconsistent with the technical teaching of Wu et al.

There is thus no disclosure in Wu et al. of the limitation “generating from said second field a synthetic field and replacing said first field by said synthetic field”, and claims 1-4 are not anticipated by Wu et al.

B. The Examiner’s Responses re Claim 9

1. The Examiner’s Responses to Appellants’ Arguments

The Examiner’s Responses to Appellants’ Arguments are almost verbatim repetitions of the same assertions that the Examiner previously made in the final Office Action at pages 9-10. In response to Appellants’ arguments set forth in the Appeal Brief, the Examiner repeats her previous reliance on the following text of Wu et al. at column 4, lines 26-34:

In particular, the scene change flag is provided to a delay 230 to account for the delays in processing the corresponding frame in the reordering delay function 215 and motion estimation stage 220, and to a picture coding type decision function 235. The function 235 sends a corresponding picture_type control signal to the encoding stage 225 to set the picture type of the current frame to be encoded. (Wu, column 4, lines 43-49.)

The Examiner states that “the delay in Wu is capable of re-adjusting or re-timing the scene change when detected at the proximity of the originally scheduled I-frame, such that a delay would have the capability to retiming the cut at a frame boundary or boundary between successive fields.

The Examiner also states that she “maintains the rejection of claim [9] as evidence[d] by Appellants’ cancellation of claim 5” in the Appeal Brief.

2. Wu Does Not Anticipate Claim 9

Appellants first point out that the cancellation of claim 5 in the Appeal Brief had nothing to do with the final rejection of claim 9. In fact, Appellants’ cancellation of claim 5 in the Appeal Brief was merely an attempt to narrow the issues for appeal by canceling claims directed to a video processing apparatus, namely claims 5-8 and 12, leaving for appeal only claims directed to a video process, namely claims 1-4 and 9-11. Appellants contend that no adverse inference may be drawn from the cancellation of claims 5-8 and 12 in the Appeal Brief.

In addition, Appellants point out that the purpose of delay 230 in Wu et al. is to ensure that the picture coding decision is in precise register with the scene change. Wu et al. do not teach that the input sequence is automatically retimed to occur at a frame boundary in the output sequence, but that Wu does not teach any retiming of the cut, where the cut occurs otherwise than at a frame boundary.

By contrast, the re-timing of a cut as recited in claim 9 operates so that, where the input fields exhibit a cut in the middle of a frame, the cut is re-timed such that the cut is instead positioned at a frame boundary in the output fields. Wu does not disclose this processing, and indeed the structure described in Wu is incapable of such processing. As further confirmation of the fact that Wu does not operate to re-time cut that occurs in the middle of a frame, Applicants note that Wu proposes an alternative approach to addressing the issue of cuts within a frame -- at column 2, lines 43-46, Wu proposed that, in the case of a "bad edit" where a scene change occurs at the odd/even field boundary of a frame, the step is taken of switching from frame prediction to field prediction.

Accordingly, Applicants respectfully assert that claim 9 is not anticipated by Wu et al.

II. Rejection of Claims 10 and 11 as Obvious Over Wu et al. and Holland

A. The Examiner's Responses to Appellants' Arguments

Appellants note that, in the Examiner's Answer, the Examiner did not even recite a rejection of claims 10 and 11, but rather merely repeated the final rejection of claims 5-8 and 10-12 as set forth in the final Office Action dated November 24, 2008 and referred to the rejection of claims 7 and 8 for the rejections of claims 10 and 11, respectively, without regard to the fact that claims 5-8 and 12, which relate to a video processing apparatus, were canceled in the Appeal Brief, leaving for appeal as rejected by Wu et al. and Holland only claims 10 and 11 directed to a video process. Thus, the Examiner's stated rejections, relate only to a video processing apparatus, not to a video process, which is the subject of claims 10 and 11.

In the Examiner's Response to Appellants' arguments regarding claims 10 and 11 not being obvious over Wu et al. and Holland, the Examiner stated that Wu teaches the limitations of claims 10 and 11.

B. Wu and Holland Do Not Render Claims 10 and 11 Obvious

Claim 10, dependent upon independent claim 9, additionally recites that the step of retiming comprises generating a synthetic field through motion compensation. Claim 11, dependent upon independent claim 9, additionally recites that the step of retiming comprises generating a synthetic field through interpolation. The Examiner stated that Wu et al. teaches the limitations of claims 10 and 11 and does not allege that Holland teaches the limitations of “generating a synthetic field” as recited in claims 10 and 11.

However, as discussed above with regard to claims 1-4, there is no disclosure in Wu et al. of generating a synthetic field.

Accordingly, neither Wu et al. nor Holland teaches the steps of “generating a synthetic field”, as required by claims 10 and 11, such that these claims are not rendered obvious by the combination of Wu et al. and Holland.

III. Conclusion

No other fees are believed to be due in connection with this Reply Brief. However, if such additional fees are due, please charge any such fees to deposit account No. 50-3355.

Respectfully submitted,



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Dated: February 17, 2010

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